



SAFETY ALERT 03-04

17th Coast Guard District
United States Coast Guard
P. O. Box 25517
Juneau, Alaska 99802
907-463-2810 or 800-478-7369 In Alaska
www.uscg.mil/d17/m/CFVS.shtml

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CREWMAN KILLED WHILE SORTING FISH ON A TRAWLER NEAR KODIAK ISLAND

Background: The Seventeenth Coast Guard District Safety Alert program provides “Lessons Learned” from marine casualties in support of the Coast Guard’s “Ready for Sea” safety program.

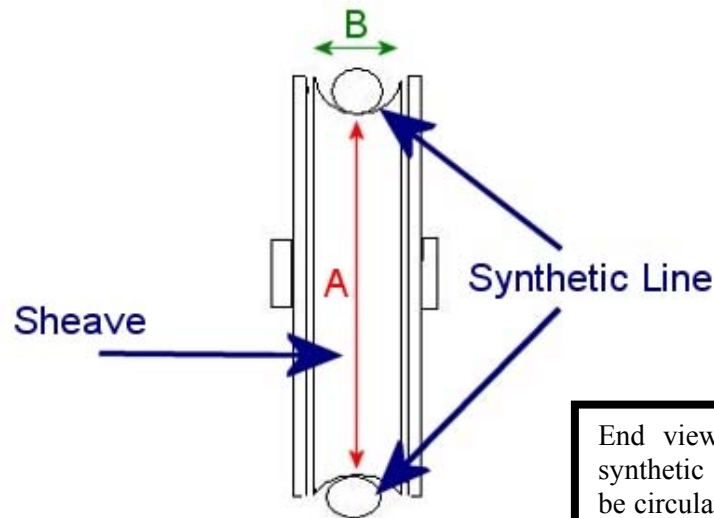
Incident: Three crewmembers were working in the trawlway sorting the catch before loading it into the fish hold. The cod end of their four section net normally held 100,000 pounds of fish. Three sections of the net had already been dumped and sorted and it was time to pull the zipper on the last section. The master was running the top hook and gilson hook winch controls from a platform overlooking the deck. He operated the winch to raise the top hook and instructed a crewman to pull the zipper. As the catch spilled into the trawlway the crew heard a series of pops indicating that a line was under tension. The top hook line had parted causing the gilson line to take the full weight of the net. A crewman working in the trawlway near the forward net reel was struck in the back by either a strap or a hook and he fell forward into the trawlway. Quick action by the crew kept him from sliding into the fish hold. The injured man then stood up, complaining about his back. He was led into the galley for examination to determine the extent of his injuries. He had a deep laceration on his right arm that was later determined to be a compound fracture. He started having trouble breathing and collapsed. The crew performed CPR for 45 minutes while the master spoke with a Coast Guard flight surgeon for instructions. After 45 minutes of CPR the decision was made to stop resuscitation efforts and the victim was declared deceased of accidental causes.

Investigation determined that the synthetic top hook line was being used with a wire rope block with a “V” shaped sheave and a diameter that was 33% smaller than what the manufacturer recommended. This block caused excessive wear on the synthetic line and contributed to its failure.

Lessons Learned: Although the investigation is still under review, there are lessons learned that will benefit the fishermen.

1. High strength synthetic line is replacing wire rope in many applications on fishing vessels as it is lighter and easier to handle. Yet, synthetic line limitations and manufacturer recommendations for using the line properly to extend its life and maintain strength are not well known in the fishing industry.
2. Synthetic line should not be subjected to heat. Temperatures of 150° F and higher can damage synthetic line.
3. Synthetic line should be used with an appropriately sized block. Manufacturers recommend a 1:8 ratio (line diameter to sheave diameter). This is considered critical to reducing wear. The sheave should be round in shape and at least 20% larger than the diameter of the line to prevent chafing.
4. Although there is no required safe working load, a common industrial standard recommends a 1:5 safety factor when using synthetic line for vertical lifting (such as a top hook). Therefore a line with a breaking strength of 110,000 pounds should only lift 22,000 pounds. In this case the manufacturer reports that at a 1:5 ratio, a line could make an average of 750 lifts before failure.

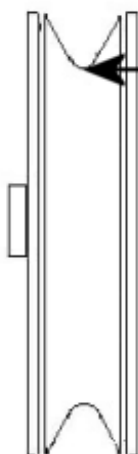
5. Replace synthetic line based on how heavily it is used. Follow manufacturer guidelines and replace the line when individual strands are worn more than 25% and consider replacing line when it has been subjected to severe shock loading. Most importantly, obtain the manufacturer information for the synthetic line in use on your vessel.
6. Never use wire rope sheaves for synthetic or natural fiber lines. Always follow manufacturer specifications when installing any rigging bearing weight.



End view of recommended sheave for synthetic line. The sheave groove should be circular and not “V” shaped so the line does not rub on the sheave.

Sheave (A) diameter should be eight times the diameter of the line.

Sheave (B) width should allow for a gap on each side of the line that is at least 10% of the line’s diameter.



The “V” shape of a wire rope sheave chafes synthetic line and causes heat friction resulting in greatly reduced strength.

Wire rope sheaves are not recommended for synthetic line